

INTERNATIONAL SEARCH REPORT

International application No.

PCT/JP2004/O 15001

A. CLASSIFICATION OF SUBJECT MATTER
Int.Cl⁷ C07D307/91, 333/76

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int.Cl⁷ C07D307/91, 333/76

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
CAPLUS (STN), REGISTRY (STN)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1344788 A1 (SUMITOMO CHEMICAL CO. LTD.), 17 September, 2003 (17.09.03), Particularly, compounds D-H, N, R, S, V, & US 2004-2576 A 01 January, 2004 (01.01.04) & JP 2004-2703 A 08 January, 2004 (08.01.04) & JP 2004-59899 A 26 February, 2004 (26.02.04),	1-2
X	US 6022307 A (AMERICAN CYANAMID CO.), 08 February, 2000 (08.02.00), Particularly, compounds 3a, 9, 10 (Family: none)	1-2

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search
20 December, 2004 (20.12.04)

Date of mailing of the international search report
18 January, 2005 (18.01.05)

Name and mailing address of the ISA/
Japanese Patent Office

Authorized officer

Facsimile No.

Telephone No.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2-146049 A (Ricoh Co., Ltd.), 05 June, 1990 (05.06.90), Particularly, Claim 1; page 4 (Family: none)	1-2
X	US 3929832 A (THE UNITED STATES OF AMERICA AS REPRESENTED BY THE SECRETARY OF THE AIR FORCE), 30 December, 1975 (30.12.75), Particularly, compounds b, c (Family: none)	1-2
X	WO 98/30213 A2 (PARACELSIAN, INC.), 16 July, 1998 (16.07.98), Particularly, page 17 & US 5833994 A 10 November, 1998 (10.11.98),	1-2
X	SIELEX, K. et al., Prediction of gas chromatographic retention indices of polychlorinated dibenzothiophenes on non-polar columns, Journal of Chromatography, A. 2000, 866(1), 105-120, particularly, tables 1, 3, 5	1-2
X	WEBER, Roland et al., Mechanism of the formation of polychlorinated dibenzo-p-dioxins and dibenzofurans from chlorophenols in gas phase reactions, Chemosphere, 1998, Vol. Data 1999, 38(3), 529-549, particularly, page 535, 547, lines 9 to 10	1-2
X	BURKA, Leo T. et al., Identification of the biliary metabolites of 2, 3, 7, 8-tetrachlorodibenzofuran in the rat, Chemosphere, 1990, 21(10-11), 1231-42, particularly, page 1234, 1239, line 37	1-2
X	BURKA, Leo T. et al., Synthesis of possible metabolites of 2, 3, 7, 8-tetrachlorodibenzofuran, Journal of Agricultural and Food Chemistry, 1989, 37(6), 1528-32, particularly, compounds 8, 9	1-2
X	KUROKI, H. et al., Synthesis and mass spectral properties of polychlorinated dibenzofuran (PCDF) metabolites, Chemosphere, 1987, 16(8-9), 1641-7, particularly, table 4	1-2
X	US 3136782 A (DIAMOND ALKALI CO.), 09 June, 1964 (09.06.64), particularly, compound II (Family: none)	1-2

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NORSTROEM, Aake et al., Synthesis of chlorinated dibenzofurans and chlorinated aminodibenzofurans from the corresponding diphenyl ethers and nitrodiphenyl ethers, Chemosphere, 1979, 8(6), 331-43, particularly, compounds XI, XIV-XIX	1-2

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Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
(See extra sheet)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.: (2) of claim 1 and a part of claim 2 depending on (2) of claim 1

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
☐ No protest accompanied the payment of additional search fees.

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Continuation of Box No. III of continuation of first sheet (2)

Inventions of claims 1-7 have a common chemical structure as a tricyclic aromatic compound. A compound having such a structure, however, is publicly known as a prior art as disclosed in DE 10101022 A1, and thus the chemical structure cannot be a significant chemical structural feature.

The chemical structure common to compounds defined in claim 1 is a tricyclic aromatic compound having three or more condensation-reactive functional groups. A compound having such a structure, however, is publicly known as a prior art as disclosed in DE 10101022 A1, and thus the chemical structure cannot be a significant chemical structural feature.

The chemical structure common to compounds defined in claim 3 is a tricyclic aromatic compound substituted by an aromatic ring and a condensation-reactive functional group. A compound having such a structure, however, is publicly known as a prior art as disclosed in DE 10101022 A1, and thus the chemical structure cannot be a significant chemical structural feature.

The chemical structure common to compounds defined in claim 5 is a compound wherein a heterocyclic ring of a tricyclic aromatic compound is substituted by an aromatic ring. A compound having such a structure, however, is publicly known as a prior art as disclosed in (JP 2003-508393), and thus the chemical structure cannot be a significant chemical structural feature.

There is no other common matter which can be considered as a special technical feature within the meaning of PCT Rule 13.2, second sentence among these inventions. Consequently, these inventions cannot be considered so linked as to form a single general inventive concept.